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ABSTRACT

Results of this survey of 26 public and academic libraries of national stature show that the country's major libraries are fully committed to automating their library operations. Major findings of the survey show that: (1) all libraries surveyed are involved in automation; (2) all libraries surveyed have automated their catalogs and bibliographic control functions, and most have automated their acquisitions and circulation systems; (3) library automation has undergone tremendous changes, notably the improvement of the turnkey systems; (4) library automation has matured to the point of using complex database systems and sophisticated computing and data communication hardware; and (5) librarians are now much more sophisticated in their knowledge of automation and of library systems. The major accomplishment of fully integrated systems is identified as the current challenge facing librarians. Survey data are represented graphically in three exhibits included within the text, and a list of participating libraries is appended. (KM)

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library automation

A Survey of Leading Academic and Public Libraries in the United States

February 1986

by Thomas W. Mann, Jr. / Yuan Tsien D. Chao / K. Scott Hughes

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FOR THE PAST 25 YEARS, the more than 40,000 libraries in the United States have faced an ever increasing challenge of automating their operations. Libraries, more than any other type of organization, have been dramatically affected by two of the most significant phenomena of the 20th Century - the information explosion and the technology revolution.

The volume of information libraries must acquire, catalog, shelve, access, circulate, and reshelve has grown astronomically since 1950. Only through the increased use of technology have libraries been able to cope with the information explosion and still maintain the quality of service demanded by their patrons.

Beginning with relatively slow, single application card reading computers of the 1960's, librarians have laboriously migrated through each succeeding computer generation expanding the functional use of the computer. Now libraries are on the verge of realizing automation capabilities that can handle all functions of the library in a comprehensive, instantaneous, and fully interactive manner.

Peat Marwick recently surveyed the top academic and public libraries in the nation to learn of their experiences with automation and what plans they have for using technology to meet the continuing demands of the information explosion.

Executive Summary

Results of the survey clearly show the significant investment libraries are making in automation. Major findings of the survey show:

- All libraries surveyed are involved in automation efforts. Twenty-two of the twenty-six libraries surveyed will be automating one or more functions in the next two years. The other four are either planning automation projects or enhancing existing ones (see Exhibit A).

- All libraries surveyed have automated their catalogs and bibliographic control functions. Most have automated their acquisitions and circulation systems. On-line catalogs and serials control have been automated by the fewest number of libraries (see Exhibit B).

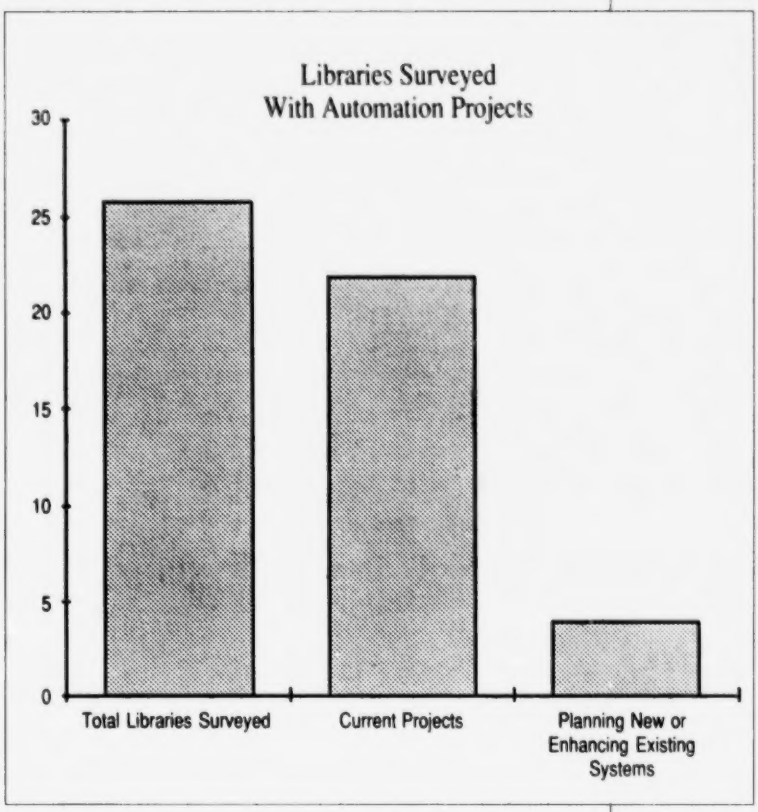
- Library automation has undergone tremendous changes. The turnkey systems now available in the market place have been greatly improved over past systems.

- Library automation has matured to the point of using complex data-base systems and sophisticated computing and data communication hardware.

- Librarians are now much more sophisticated in their knowledge of automation and of library systems.

The results of our survey show that this country's major libraries are fully committed to automating their library operations. They have made significant progress. However, the major accomplishment of fully integrated systems has not been realized and is the current challenge facing librarians.

Exhibit A



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Survey Scope and Methodology

Thirty libraries of national stature were invited to participate in the survey. The fifteen largest public libraries were selected, based on the size of their annual budget and number of volumes held in their collections. The academic libraries selected are the fifteen top libraries as ranked by the Association of College and Research Libraries. Twenty-six libraries participated in the survey and are named in Appendix A.

Key areas covered in the survey include:

- level of automation;
- types of systems installed;
- level of satisfaction with existing system(s);
- future automation plans; and level of confidence in the library's ability to plan automation programs.

The survey was designed to obtain the views of top library administrators. The survey methodology used was telephone interviews. Interviews typically lasted 30-50 minutes each. A structured interview guide was used.

The survey was intended to elicit general responses regarding levels of activity and key trends in library automation and not designed to develop statistically valid information.

Status of Library Automation

America's leading libraries have made substantial commitments to automation. All twenty-six libraries surveyed are involved in automation efforts. Twenty-two of the twenty-six libraries will be automating one or more functions in the next two years. The four that will not be automating any new functions in the next two years will be either engaged in preparatory work or involved in building on the systems currently in place. One library is continuing with retrospective conversion of bibliographic records and initiating development of a requirements definition for a new automated system. The other three libraries report that they will be enhancing current systems.

The libraries surveyed are at various stages of automation. A general trend emerges in that having automated cataloging and circulation, libraries are beginning to turn their attention to on-line public access catalogs and to serials control.

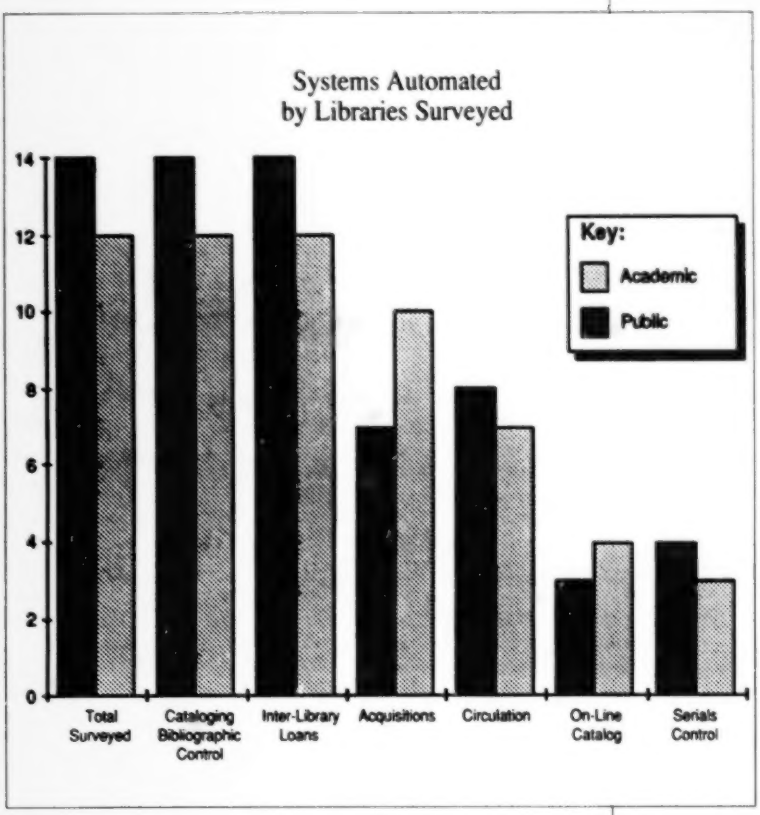
Fifteen of the twenty-six libraries, more than half the libraries surveyed, indicated that they are planning to develop an on-line catalog for patron use. The same number of libraries are planning to automate serials control. To automate these functions, the libraries are examining products and services offered by library automation vendors.

The library automation marketplace has undergone tremendous changes. The turnkey systems now available in the marketplace are perceived as greatly improved over earlier systems, in software as well as hardware.

This change parallels the growth in sophistication of librarians involved in automation. As a result of

improvements in the library automation marketplace, more libraries consider purchasing a turnkey system rather than developing a system in-house.

Exhibit B



When asked what they would do differently, two of the academic libraries surveyed commented that although none of the systems available today are able to meet all library requirements, if the library automation systems in the marketplace now were available when they were automating, they would not have developed their own.

The status of automation in the libraries surveyed can be compared to the general growth of data processing in this country. We have illustrated in Exhibit C the typical progression of data processing. The exhibit (adapted from a seminal study published by Gibson and Nolan, "Harvard Business Review," 1974) charts the four stages of growth of automation using five key technological and management components.

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Using the chart to evaluate the results of the survey, library technology today has reached the fourth or mature stage, characterized by complex database systems and sophisticated computing and data communication hardware. The other automation components are at the third stage, which is characterized by the use of more formalized controls, greater use of functional field specialists, and integrated applications. Our reasons for this assessment are as follows:

- *Librarians are now much more sophisticated in their knowledge of automation and of library systems.* A high level of confidence was expressed by library administrators in the ability of their staff to utilize existing systems and to plan new directions. Only a few of the libraries surveyed saw the need to augment staff; most of these new positions were for programmers, systems analysts, and computer operations staff.

- *Earlier automated systems are being replaced by new and improved systems.* Five libraries reported that a turnkey system has been or will be selected to replace an in-house developed module. Only one library will change from a turnkey system to an in-house developed system.

- The trend toward turnkey systems reflects the improved systems that are now available, both in hardware and software. Complex integrated systems, such as an on-line public access catalog, are feasible because of the current generation of computers with vastly expanded data processing and communications capabilities.

- *Libraries are planning integrated systems.* The capability for integrating various library functions plays an important part in choice of hardware and software. The shift towards turnkey systems is a reflection of the trend toward integrated systems. The cost of developing an integrated system by one institution alone is prohibitively high; turnkey system vendors can spread development cost among a number of library clients.

- *Progress in automation has meant an increase in controls.* In libraries, this is reflected in the

increasing awareness of the importance of authority control. Although our survey made no attempt to cover authority control, four librarians mentioned they would be adding on-line authority control. Two other libraries already have on-line authority control in place.

Library automation thus appears to be following a path in a maturing process that is similar to the growth of data processing in other organizations. It has advanced much but is still moving toward achieving the goals of integrated systems, formal planning and management control, and a more active role on the part of librarians in initiating and leading the design of systems.

The following section describes key findings of the survey. Findings are grouped by major topics of interest.

Overview of Key Findings

Responses to the survey, as well as selected other published data describing library automation activities, reflect that the nation's leading libraries are undertaking significant automation efforts. The pace toward automation and the degree

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Exhibit C

Typical Growth of Data Processing

Key Components	1 Initiation	2 Expansion	3 Formalization	4 Maturity
Management Techniques	Technical in Department of First Application	Informal Controls Among Several Departments	Formalized Controls Organization	Formal Planning and Management Control
Personnel Specialization	Programmer/ Operator	Programmer/ Analyst	Business, Data Processing Analysts	Technology Specialists
Technology	Early Computers	Second/Third Generation Computers	Total MIS	Database/Data Communications
User Capabilities	Hands-Off Attitude	Participates but Dependent on DP Personnel	Capable of Participating Knowledgeably	Capable of Initiating and Leading Design Activity
Application Portfolio	Stand-Alone Applications	Stand-Alone Systems	Integrated Applications	Integrated Systems

Key: ☐ = Status of automation in leading libraries

Stages of Growth →

to which functions are automated is determined by local factors such as organizational mission, funding, and user demands for services.

Some of the key findings of our survey are:

Over Half of the Libraries Surveyed have Automated Cataloging, Interlibrary Loans, Circulation, and Acquisitions

All twenty-six libraries surveyed have automated their cataloging and interlibrary loan functions. All plan to or have automated circulation and acquisitions. Seventeen libraries have automated acquisitions systems and fifteen libraries have automated circulation systems. This represents over half of the libraries surveyed.

The next functions for focus of automation are serials control and on-line catalogs. Of the twelve academic libraries participating in the survey, three have already automated serials control, another two are in the process of automating serials control, and seven are planning to automate this function.

The figures for the fourteen public libraries participating in the survey

are similar--four libraries have already automated serials control, one library is in the process of automating serials control, and eight other libraries are planning to automate this function.

For on-line catalogs, three academic libraries are in the process of putting in an on-line catalog, and fifteen libraries (ten public libraries and five academic libraries) are planning to have on-line catalogs. With other functions such as circulation, cataloging, acquisitions, and interlibrary loan largely automated, libraries are turning their attention to the complexity of serials control systems and on-line public access catalogs.

Few Libraries Surveyed Have Converted Catalog Records

Since the libraries participating in this survey are the largest public and academic libraries in the United States, it is not surprising that relatively few have fully converted their cataloging records.

Of the twelve academic libraries surveyed, only two have converted all of their monographs and five have converted all of their serials. However, in ten libraries monographs are partially converted, and in seven libraries serials are partially converted.

Of the fourteen public libraries surveyed, six libraries have fully converted their monographs and four have fully converted their serials. Eight libraries have partially converted monographs and seven libraries have partially converted serials.

OCLC is the Primary Bibliographic Utility Used by the Libraries Surveyed

OCLC is predominant among the bibliographic utilities. Nineteen of the libraries surveyed are using OCLC, versus seven using RLIN. Four libraries (two academic and two public) reported using both OCLC and RLIN.

For turnkey systems, no single vendor has achieved predominance among the survey libraries. Nine different vendors were identified. Twelve out of the seventeen libraries using a turnkey system selected their system on the basis of competitive bidding. Only five libraries did not go through

the bid process for the selection of a system.

Systems developed in-house are primarily circulation, cataloging, or acquisitions. Nine libraries reported having an in-house developed circulation system, cataloging system or acquisitions system, whereas only four libraries reported a locally developed serials control system, six reported a locally developed on-line catalog, and five reported a local interlibrary loan system.

The hardware of fourteen of these libraries is managed by other campus or city personnel. Nine libraries have library staff managing their hardware.

Telecommunications is of Major Concern to Library Administrators

A major area of concern for library administrators was telecommunications. Fifteen out of the twenty-six libraries surveyed were moderately satisfied with their current telecommunications facilities, which was the use of dial-up or dedicated lines. The public libraries were less satisfied than the academic libraries.

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Of the academic libraries, five reported that they were highly satisfied with their current telecommunications systems, four reported that they were moderately satisfied with their telecommunications systems, and one library reported that they were not satisfied with the telecommunications facility currently in use.

Of the public libraries surveyed, only three were very satisfied with the existing telecommunications system while eleven were only moderately satisfied. A number of interviewees expressed their concern over the increasing high cost of telecommunications.

One of the libraries surveyed recently switched to the use of fiber optic cables, and reported that it is a great improvement over regular (copper wire) lines.

None of the libraries surveyed have yet experimented with alternatives such as microwave, packet radio, or satellite.

Telecommunications is an uncharted area and seven libraries have stated that it is an area in which they would need assistance.

Acquisitions, Circulation and Serials Control are Focus for New Systems Development

The public libraries will be targeting acquisitions, circulation, and serials control for automation in the next two years. The academic libraries will be focusing on serials control and on-line public access catalogs. Of the twelve academic libraries surveyed, five libraries are planning to automate serials control and five are planning for an on-line catalog. Of the fourteen public libraries surveyed, five indicated that they are planning to automate acquisitions, three are planning to automate circulation, three are planning to automate serials control, and three are planning for on-line catalogs.

A number of libraries are planning to or have replaced an old system with a new system. Four public libraries and four academic libraries will be replacing or have replaced their old circulation system with a new circulation system. This correlates with the finding that circulation was the first function automated at eight academic and eight public libraries. Libraries have outgrown these systems and are replacing them with improved hardware and software.

Although the number of libraries where cataloging was automated first is high (seven public libraries and six academic libraries), due to the use of bibliographic utilities, libraries are able to take advantage of enhancements offered as the utilities grew. However, some libraries are augmenting these services with catalog maintenance on a local system. At present these modules are seen not as a substitute for bibliographic utilities, but as an enhancement to facilitate the updating of local data.

Conclusion

Library administrators have high levels of confidence in the ability of staff to plan for their automation

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programs and to utilize existing systems effectively. Of the twenty-six library administrators surveyed, twenty were highly confident of their staff's abilities. None expressed a lack of confidence in their staff.

The challenges facing libraries are to continue to utilize advanced technology and develop integrated systems. Librarians faced with these challenges will need to institute formal planning and management controls and identify and bring to their staff personnel who are technology specialists capable of working with the automation marketplace in designing systems. In this way, the key components of library automation will progress to the mature stage of growth.

Appendix

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Library Automation Survey

Libraries Participating

Boston Public Library
Chicago Public Library
Dallas Public Library
Denver Public Library
Detroit Public Library
Houston Public Library
Los Angeles Public Library
Los Angeles County Public Library
Miami-Dade Public Library System
Minneapolis Public Library and Information Center
New York Public Library - The Branch Libraries
Queens/Borough Public Library
St. Louis Public Library
San Francisco Public Library

Harvard University
Indiana University at Bloomington
Ohio State University
Stanford University
University of California - Los Angeles
University of Illinois
University of Michigan
University of Minnesota
University of Texas
University of Washington
University of Wisconsin, Madison
Yale University

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The Survey Team

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